

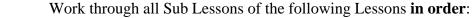
Concept: Binomial Probabilities

Name:

COMPUTER COMPONENT

Instructions: In □ ► ATH X follow the **Content Menu** path:

Probability > Binomial Probabilities



- Binomial Probabilities ... What Are They
- Flipping a Coin ... Once
- Flipping a Coin ... Twice
- Flipping a Coin ... Three Times
- Summary

Additional Required Materials: Pennies and Nickels

As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

SUMMARY

1. Demonstrate your knowledge of Binomial Probabilities by filling in the spaces below.

Zero probabilities occur in any situation where there are **zero** possible outcomes. **Tree** diagrams are a helpful tool for outlining all the outcomes for a particular situation.

2. Flipping a Coin

What is the probability?

P(heads) =
$$\frac{1}{2}$$
 P(tails) = $\frac{1}{2}$

3. Flipping a Coin Twice

What is the probability?

$$P(2 \text{ heads}) = \frac{1}{4}$$
 $P(1 \text{ head}) = \frac{2}{4} = \frac{1}{2}$ $P(0 \text{ heads}) = \frac{1}{4}$





4. Flipping a Coin Three Times

Recreate the tree diagram that shows all of the outcomes from flipping a coin three times. What is the probability of flipping 3 tails?

Flip	Heads	Heads	Heads	ННН
			Tails	HHT
		Tails	Heads	HTH
			Tails	HTT
	Tails	Heads	Heads	THH
			Tails	THT
		Tails	Heads	TTH
			Tails	TTT

The probability of flipping 3 tails is $\frac{1}{8}$.

OFF COMPUTER EXERCISES

- 1. Calculate the following probabilities from the experiment of flipping a coin three times:
 - (a) P(0 heads) = $\frac{1}{8}$
 - (b) P(1 head) = $\frac{3}{8}$
 - (c) P(2 heads) = $\frac{3}{8}$
 - (d) P(3 heads) = $\frac{1}{8}$
- 2. Now we'll look at all of the numerators in the probabilities that we have studied today.

numerators from 1 toss 1 1 1
numerators from 2 tosses 1 2 1
numerators from 3 tosses 1 3 3

Can you predict the numerators that will occur in the row for 4 tosses?

1 4 6 4 1





3. For this experiment you will be tossing a penny and a nickel, once. *Use a tree diagram to list all possible outcomes for this experiment.*

	(P) H (N) T
(D) Donny & (N)	(P) H (N) H
(P) Penny & (N) Nickel Toss	(P) T (N) T
NICKEI 1088	(P) T (N) H

(a) What is the probability that the penny lands heads?

The probability that the penny lands on heads is $\frac{1}{2}$.

(b) What is the probability that both coins land heads?

The probability that both coins land on heads is $\frac{1}{4}$

(c) What is the probability that the coins do not match when tossed?

The probability that the coins don't match when tossed is $\frac{2}{4}or\frac{1}{2}$.

4. What is the probability of flipping a coin two times and getting no heads? *Show your thinking below.*

		Heads	
Flip	Heads	Tails	
	Tails	Heads	
	Tans	Tails	

The probability of flipping a coin two times and getting no heads is $\frac{1}{4}$ as indicated in my tree diagram. 1 out of 4 results indicates/demonstrates the probability of getting no heads.

